

1999 National Scale Air Toxics Assessment

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Overview

- Background on National Program
- Overview 1999 National Scale Air Toxics Assessment

Components of the National Air Toxics Program

- Source Specific and Sector Specific Standards (e.g., MACT standards, residual risk standards, mobile source standards)
- Multi-media and cumulative risk initiatives
 - Integrated Urban Air Toxics Strategy
 - Community/local scale assessments
 - Indoor Air
 - Mercury and persistent bioaccumulative toxics

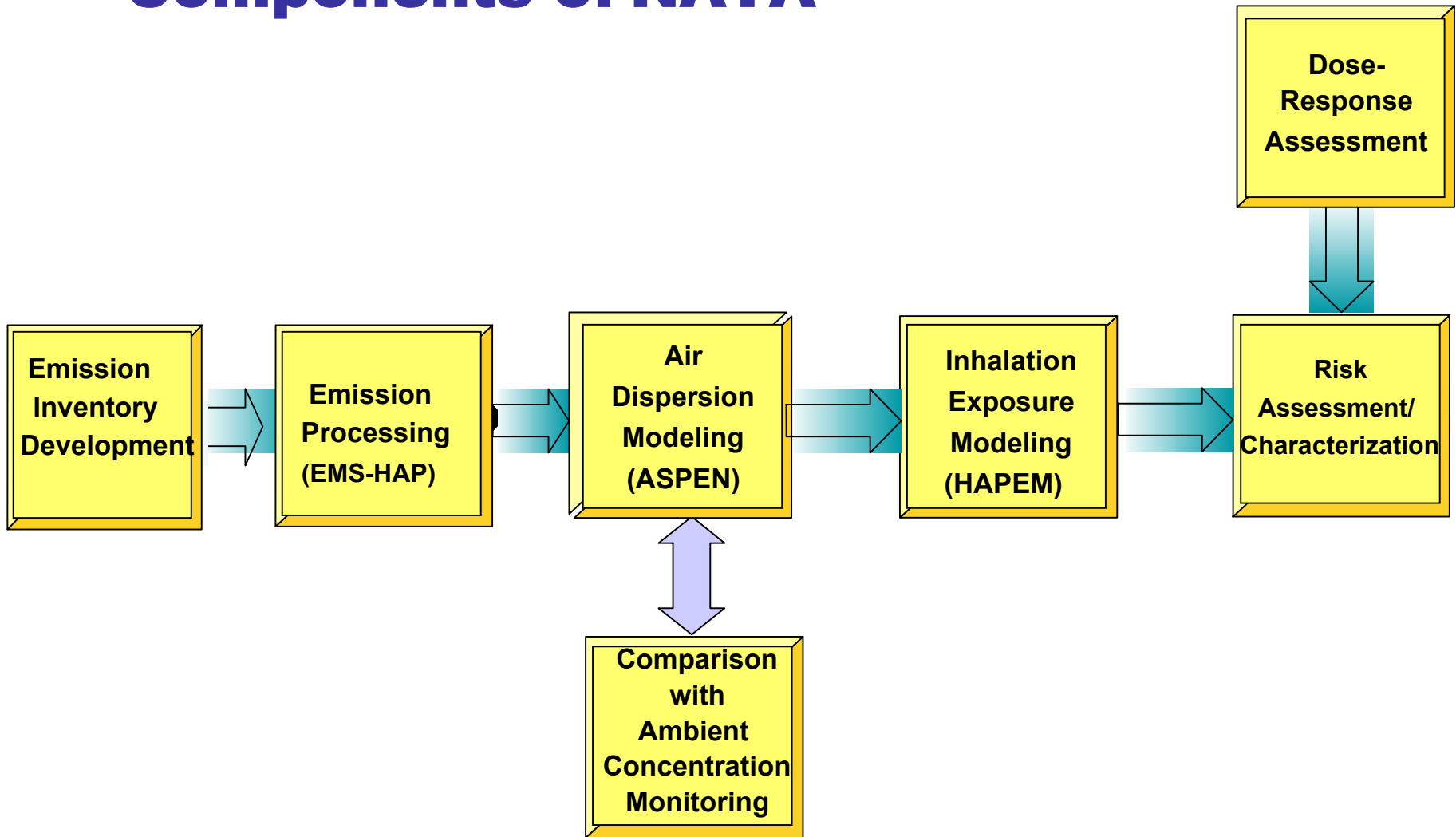
Components of the Air Toxics Program

- Education and Outreach
- National Air Toxics Assessments
 - Air Toxics Monitoring
 - Emissions Inventory
 - Ambient Air Quality and Exposure Modeling
 - Research on Health Effects and Risk Assessment Tools

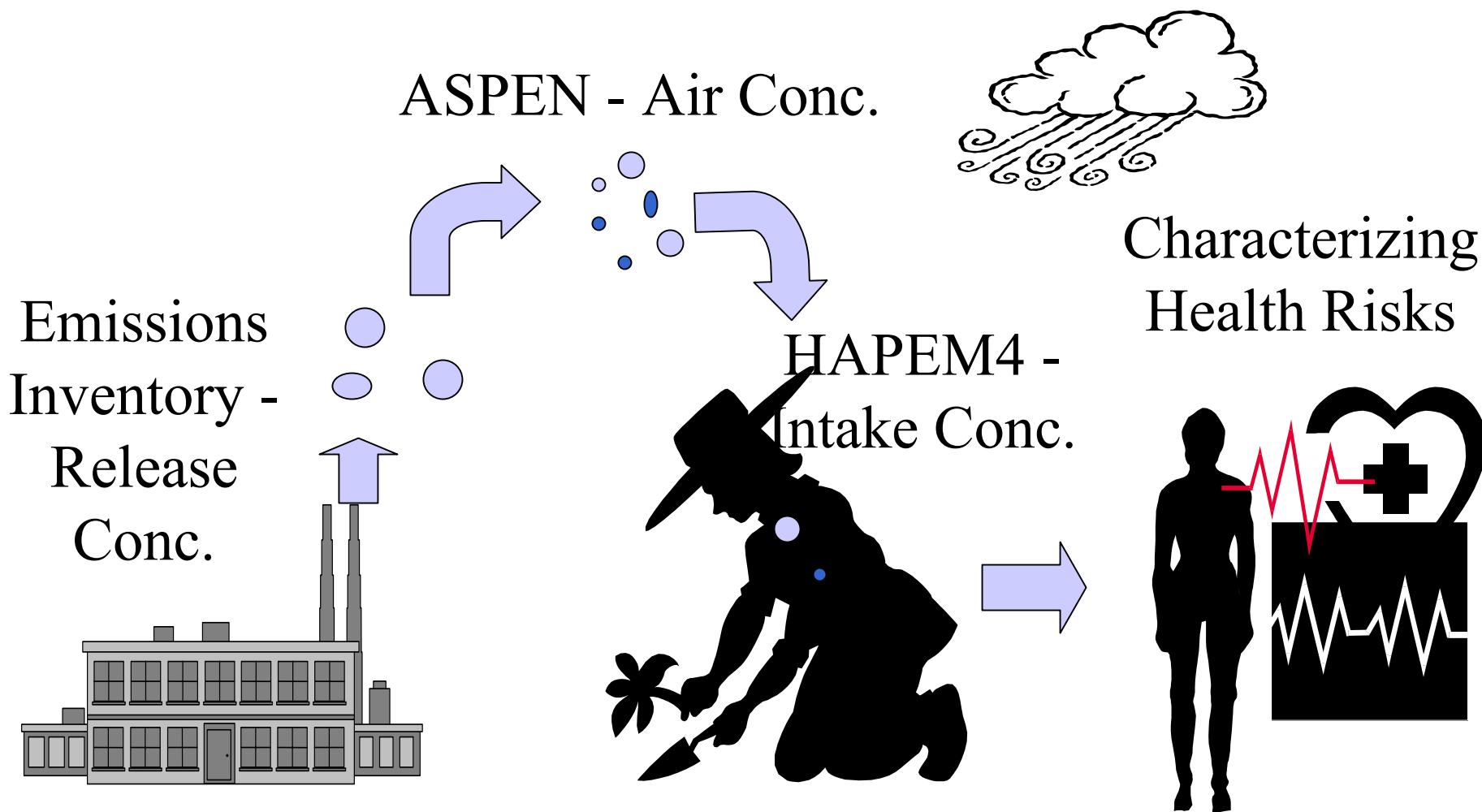
What is the National Scale Air Toxics Assessment (NATA)?

- **Characterization of air toxics across the nation**
 - Nationwide assessment with census tract resolution for 177 HAPs plus diesel PM
 - Emissions, modeled ambient concentrations and estimated inhalation exposures from outdoor sources
 - Cancer and noncancer risk estimates for the 133 HAPs with health data based on chronic exposures
- **Tools for State/Local/Tribal Agencies (and EPA) to prioritize pollutants, emission sources and locations of interest**
 - Provides a starting point for local-scale assessments
 - Focuses community efforts
 - Informs monitoring programs

Components of NATA



NATA Modeling



NATA Emissions Inventory

- Sources Include:
 - Major Stationary Sources (e.g., incinerators and manufacturing facilities)
 - Non-point sources (e.g., dry cleaners, residential fuel burning)
 - Onroad and Nonroad Mobile Sources (e.g., cars, trucks, and boats)

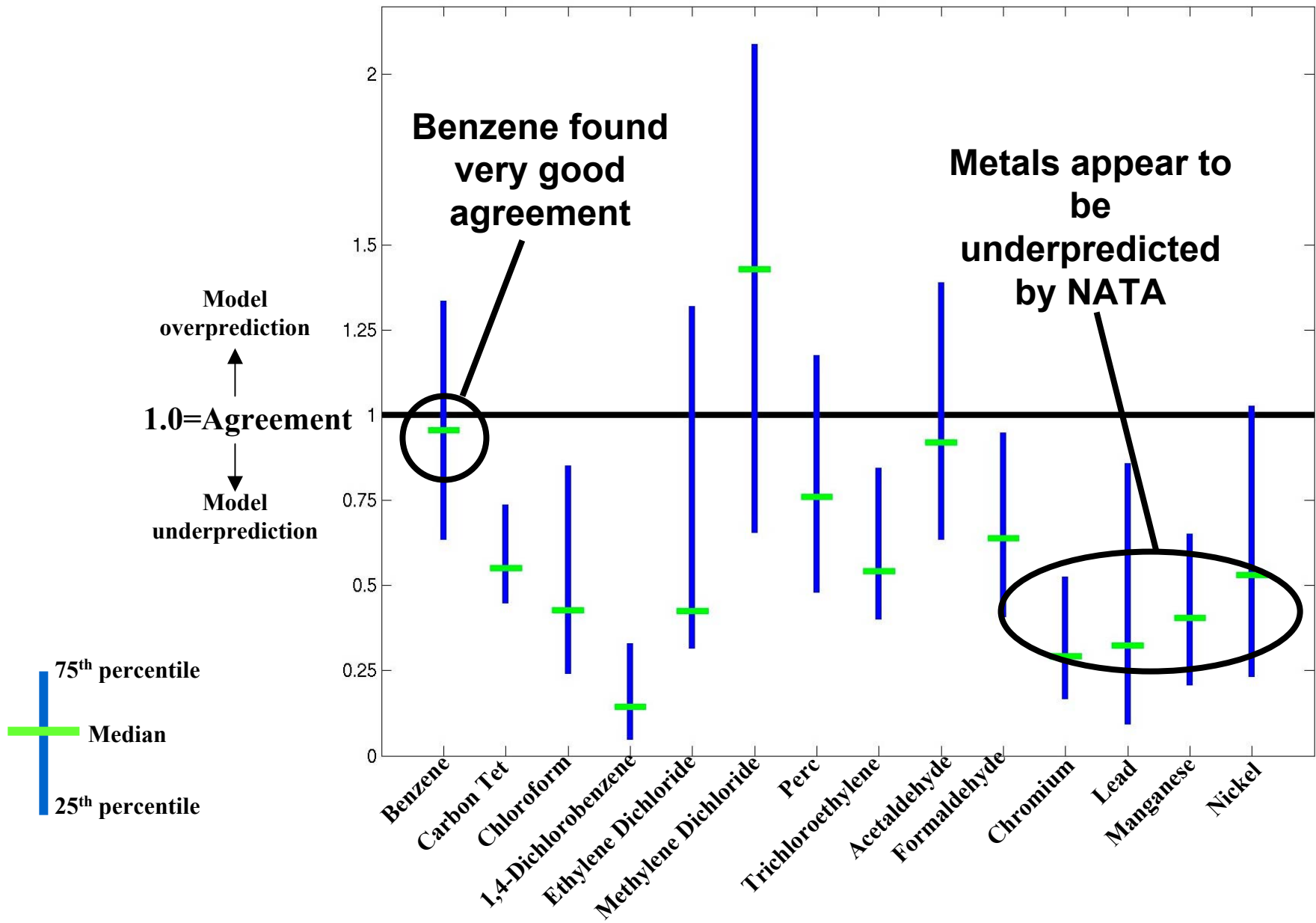
NATA Emissions Inventory

- **Five Primary Sources of Data:**
 - State and local air toxics inventories
 - EPA existing MACT databases
 - Toxics Release Inventory (TRI)
 - Mobile source emissions estimates from EPA's Office of Transportation and Air Quality
 - Non-point source estimates using emission factors and activity data

1999 NATA Limitations

- Based on 1999 data
- Inhalation risks only
- Excludes indoor air sources
- Does not capture localized impacts
- Background emissions (natural sources, long range transport) are estimated values over broad geographic regions

Model to Monitor Comparison



How is 1999 NATA different from 1996 NATA?

- More complete inventory
- Risk assessment for all air toxics with health data (133 vs. 32 HAPs)
- Uses the latest health effects information
- Background estimates refined
- Should NOT be compared due to these improvements

Overall Summary of 1999 NATA Results

- The **average cancer risk** for 1999 is **42 in a million (1 in 20,800)**
 - **Benzene** is most significant carcinogen*
 - Connecticut average cancer risk for 1999 is **41 in a million**
 - To put this in perspective:
 - radon presents a risk of 2,000 in a million (1 in 500)
 - However, emissions of radon are naturally produced
 - it is estimated that one out of every three Americans will contract cancer during a lifetime, when all causes are taken into account.
 - Two thirds of this risk is due to smoking or lifestyle factors

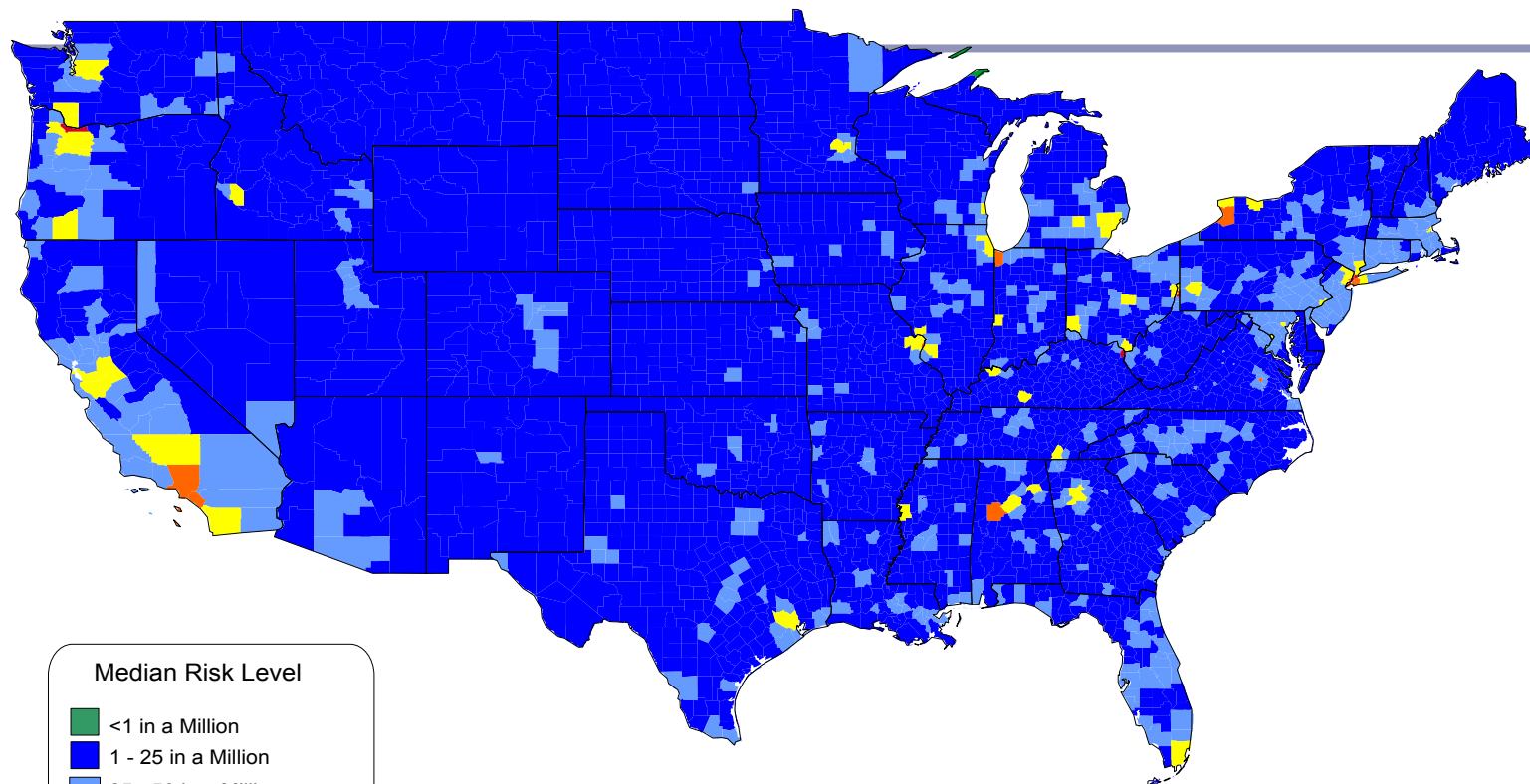
Note: This is an estimate of the average American's chance of contracting cancer from breathing the air toxics analyzed here, if they were exposed to 1999 emissions levels for 70 years. This assessment does not include indoor air, diesel emissions, non-inhalation exposure pathways. Risks from PM and other criteria pollutants are not included in this assessment.

Overall Summary of 1999 NATA Results

- The **average noncancer risk** for 1999 is **6.4** (hazard index for respiratory)
 - **Acrolein** a majority of this risk
 - Connecticut average noncancer risk for 1999 is **5.5** respiratory hazard index

Aggregate exposures **below a Hazard Index of 1.0** will likely not result in adverse noncancer health effects over a lifetime of exposure

1999 NATA - National Scale Assessment Predicted County Level Cancer Risk – County Medians

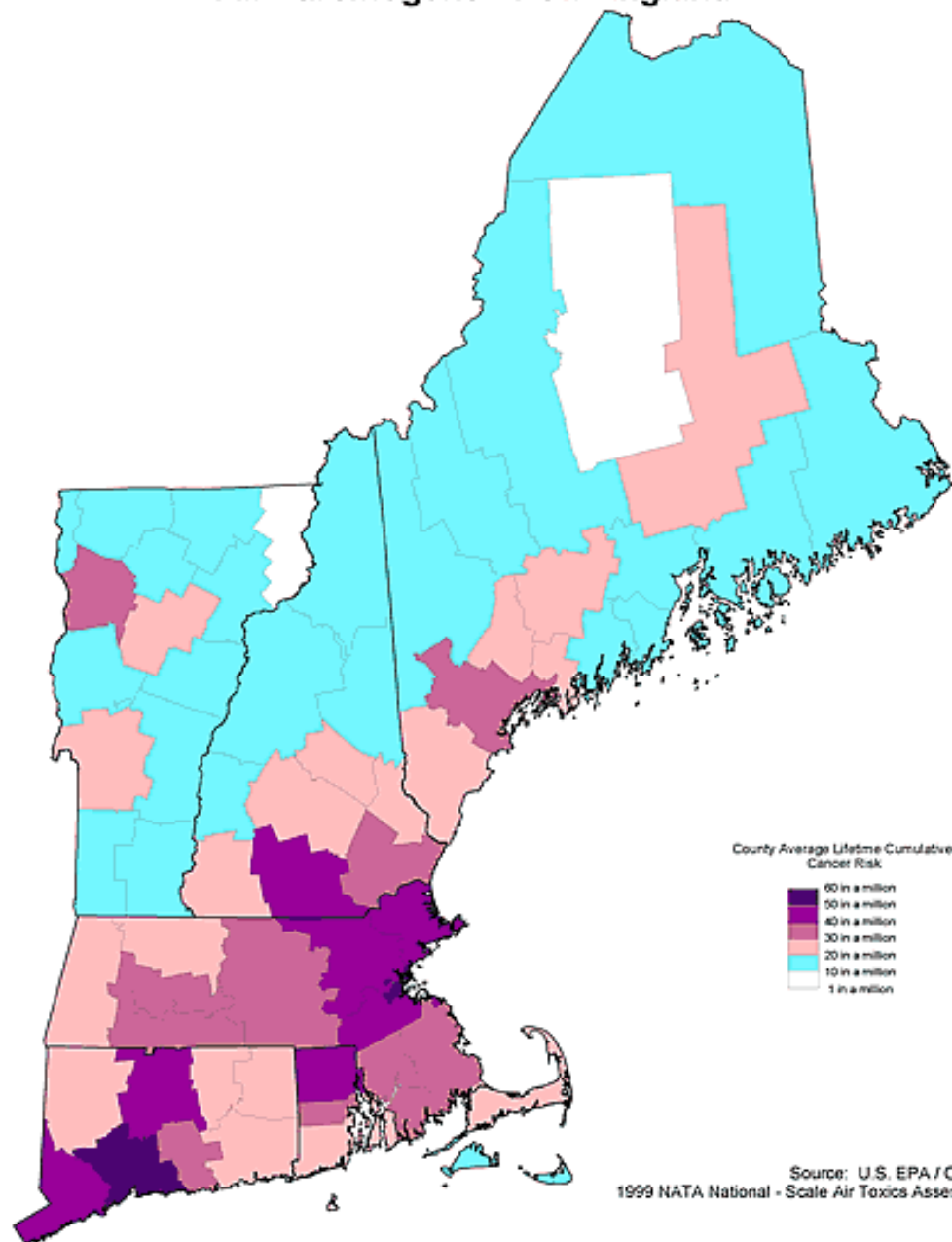


Median Risk Level



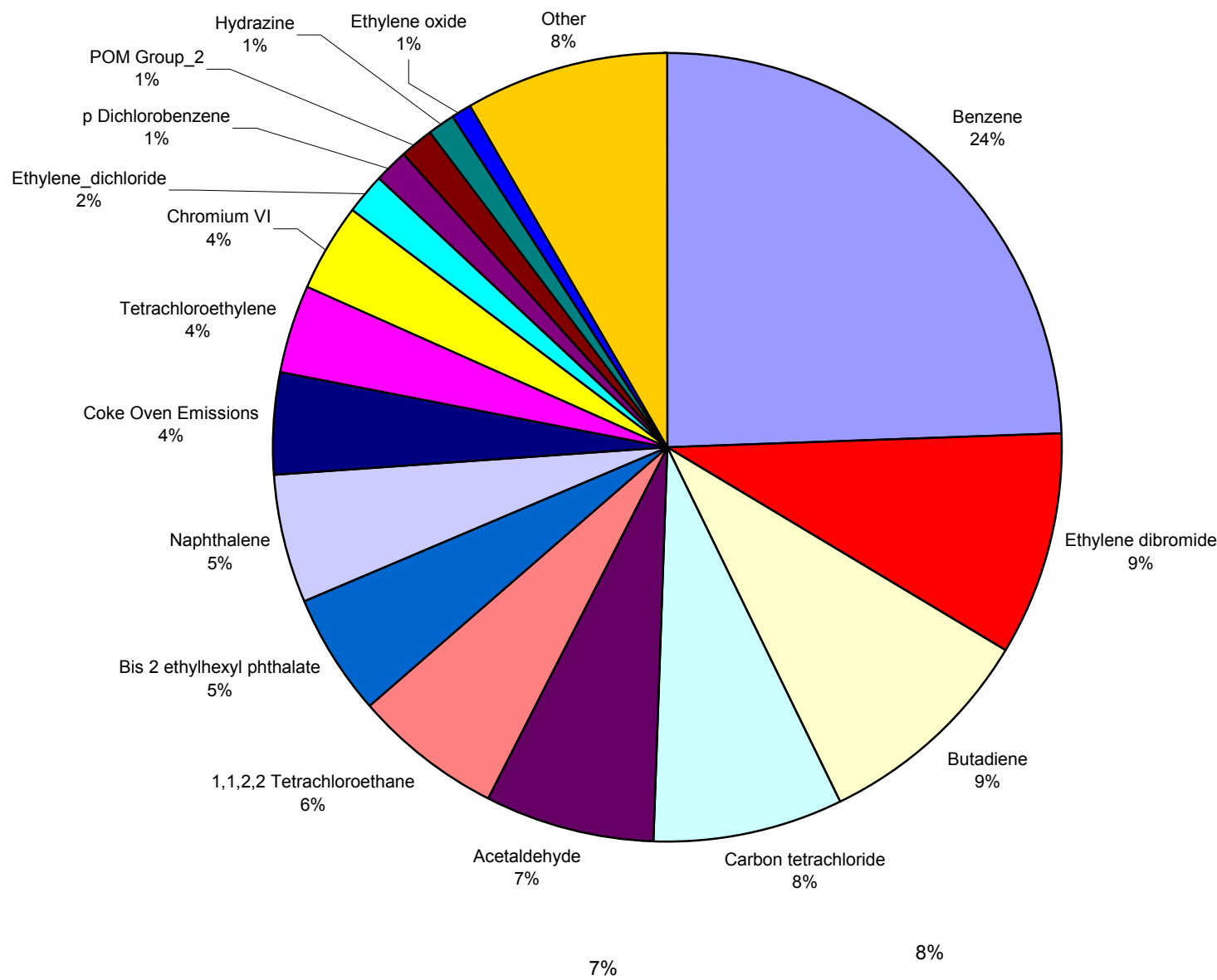
Spatially, most of country predicted to have risk between 1 and 25 in a million
Most urban locations greater than 25 in a million
Transportation corridors and some locations greater than 50 in a million
Several counties greater than 100 in a million

**1999 National Scale Air Toxics Assessment
Estimated County Level Carcinogenic Risk
All Carcinogens - New England**



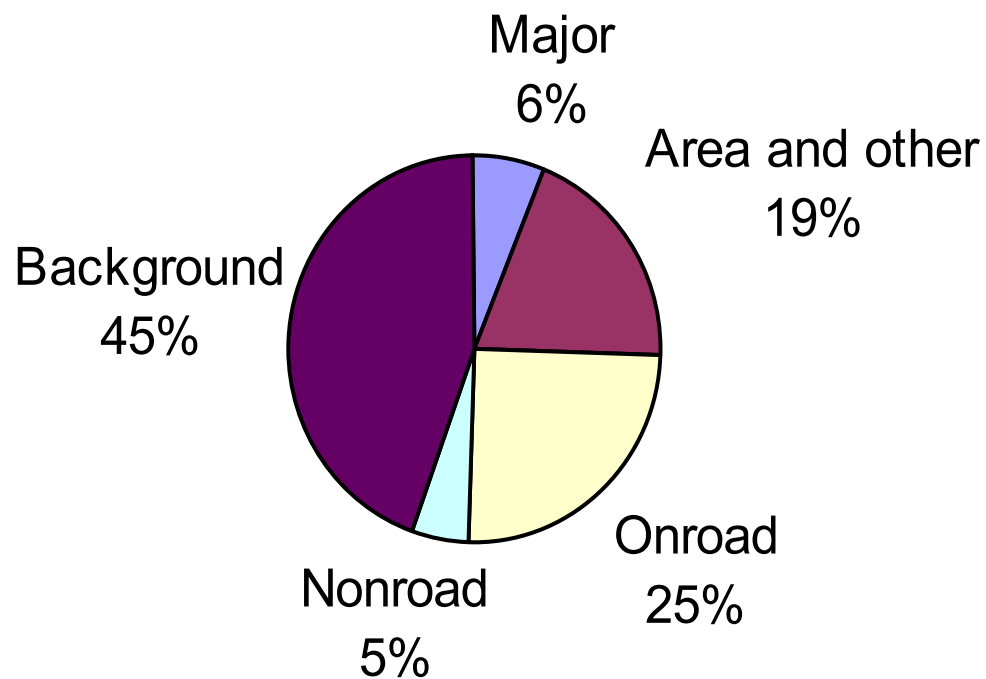
Source: U.S. EPA / OAQPS
1999 NATA National - Scale Air Toxics Assessment

1999 NATA - Pollutant Contribution to Average Cancer Risk (42 in a million)

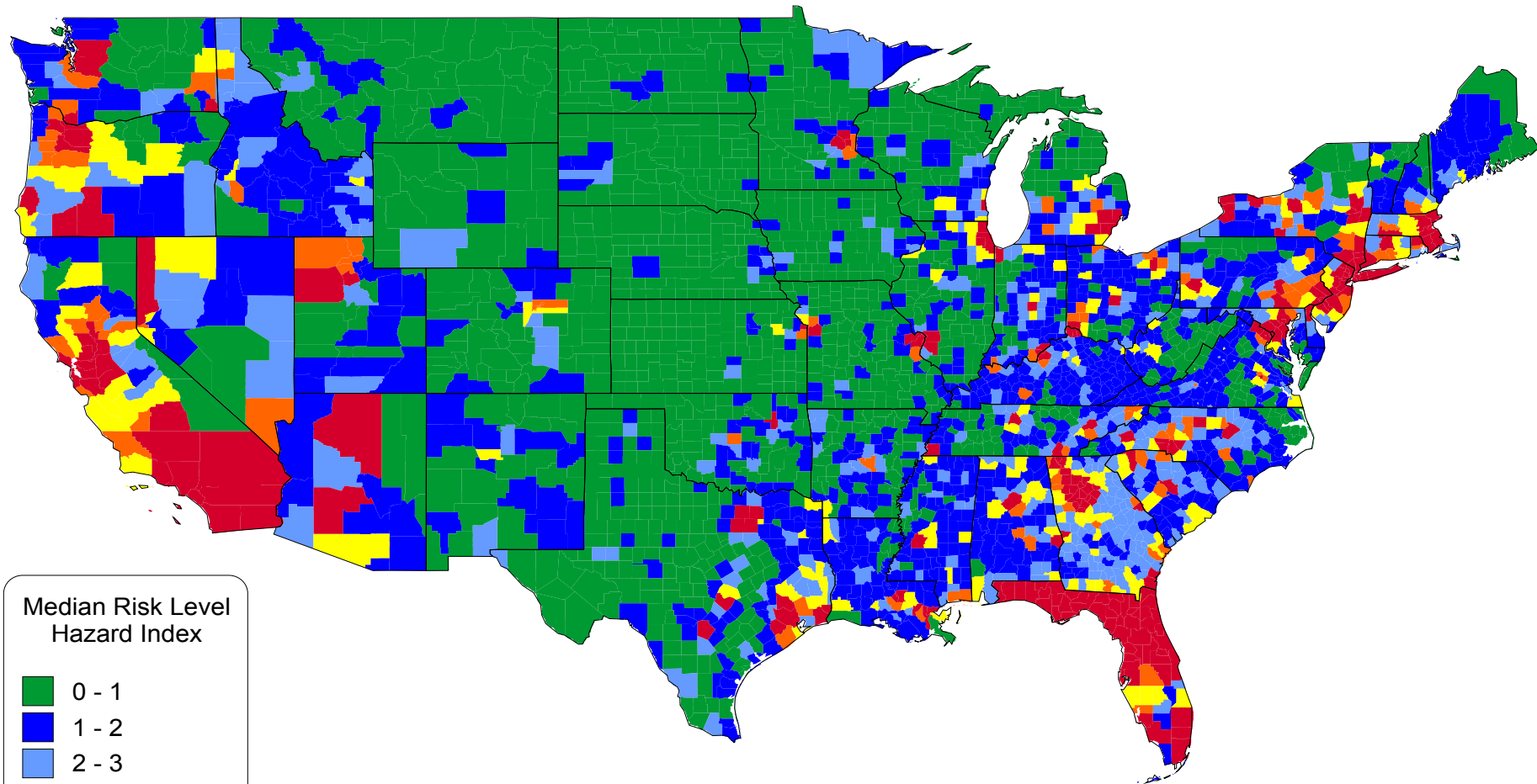


Note: NATA does not include radon, indoor air, diesel emissions, dioxins, or non-inhalation exposure pathways.

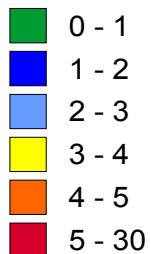
1999 NATA Cancer Risk Source Sector Contributions



1999 NATA - National Scale Assessment Predicted County Level Noncancer (Respiratory) Risk

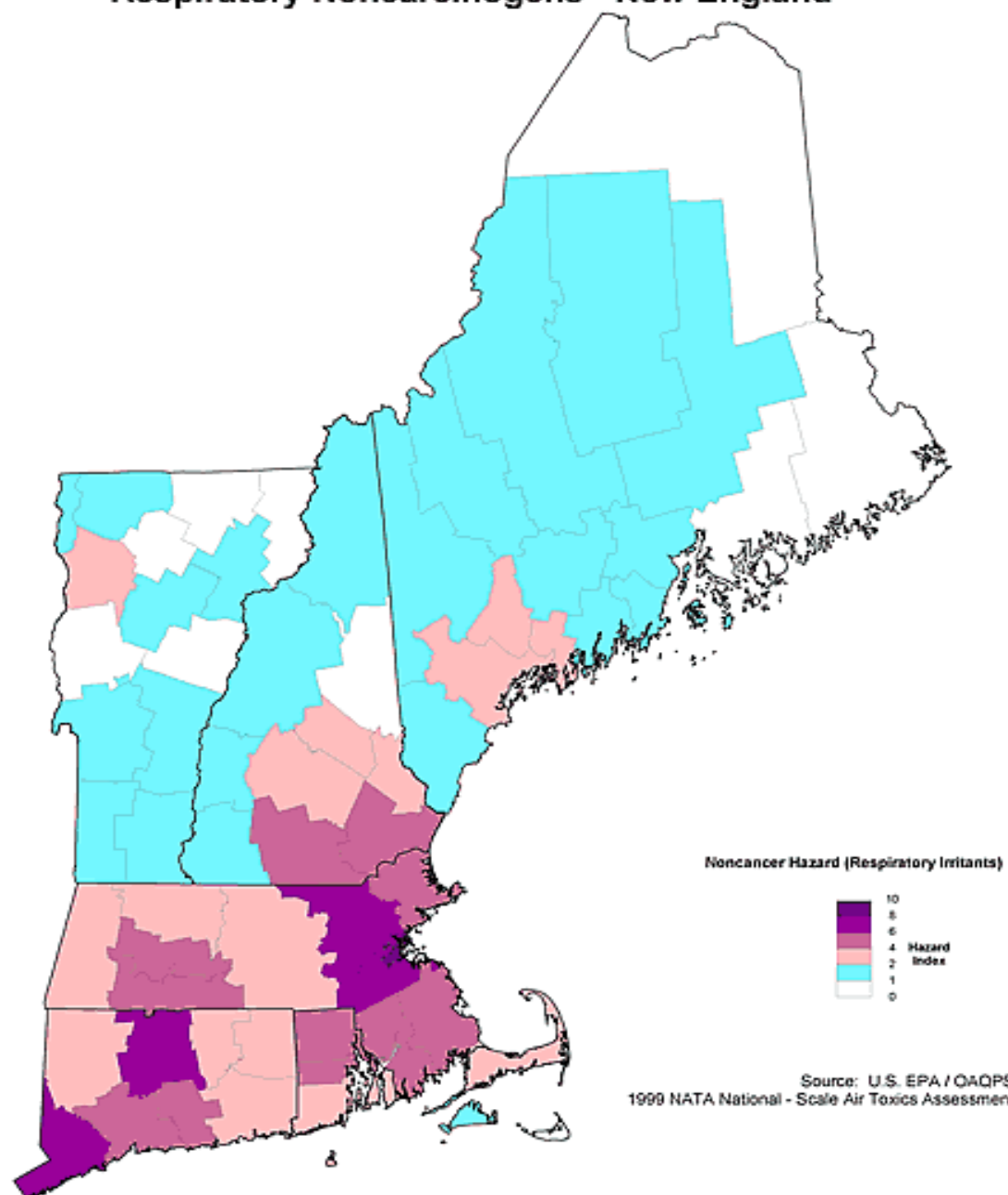


Median Risk Level
Hazard Index

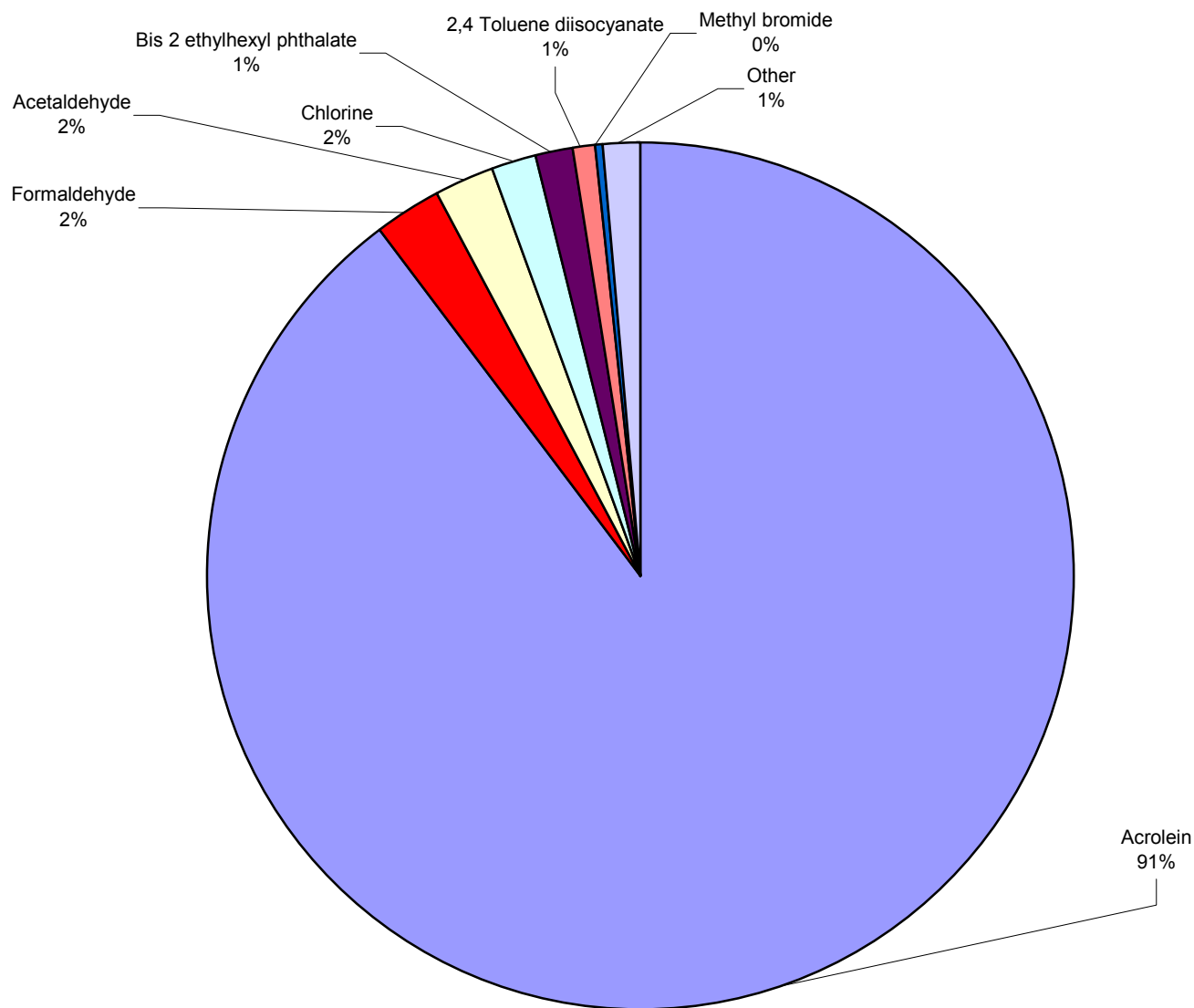


Over 40% of counties hazard index greater than 1
Several counties hazard index greater than 10
High values in Florida from forest fires

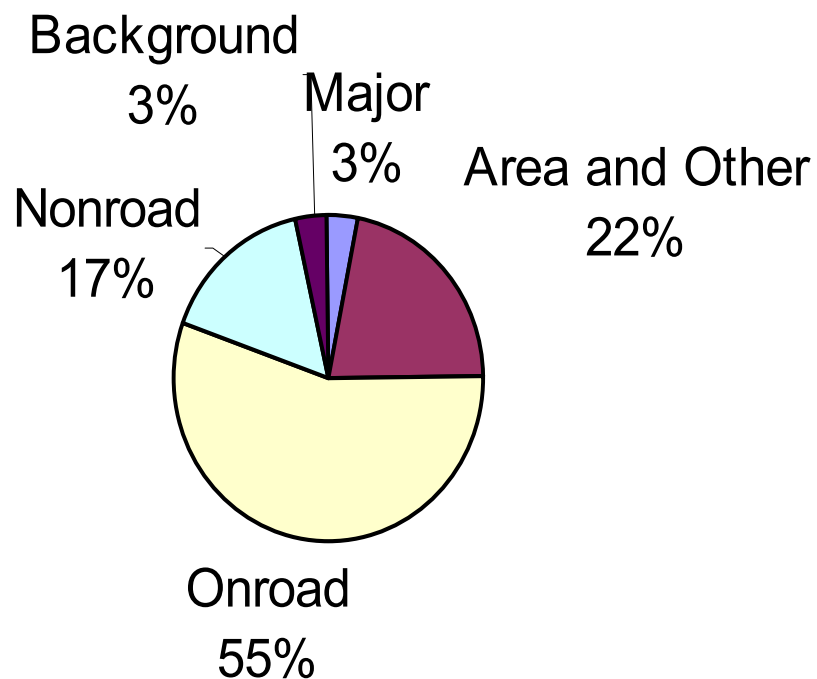
**1999 National Scale Air Toxics Assessment
Estimated County Average Noncancer Hazard
Respiratory Noncarcinogens - New England**



1999 NATA - Pollutant Contribution to Average Noncancer Risk (HI=6.4)



1999 NATA Noncancer Respiratory Risk Source Sector Contributions



EPA New England Air Toxics of Greatest Concern

- acetaldehyde
- acrolein
- bis-2-ethyl hexylphthalate
- benzene
- 1,3-butadiene
- carbon tetrachloride
- ethylene dibromide
- 1,1,2,2 tetrachloroethane
- diesel PM

How To Use This Information

- Prioritize Air Toxics of Concern
- Characterize Relative Contributions of Air Toxics by Emissions Sources
- Identify Areas for Further Study
- Tool for Communities to Target Risk Reduction
- Set Priorities for Collecting More Data

Results of 1999 NATA

- <http://www.epa.gov/ttn/atw/nata1999/>
(EPA HQ)
- <http://www.epa.gov/region01/eco/airtox/>
(EPA Region I Analysis)